

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

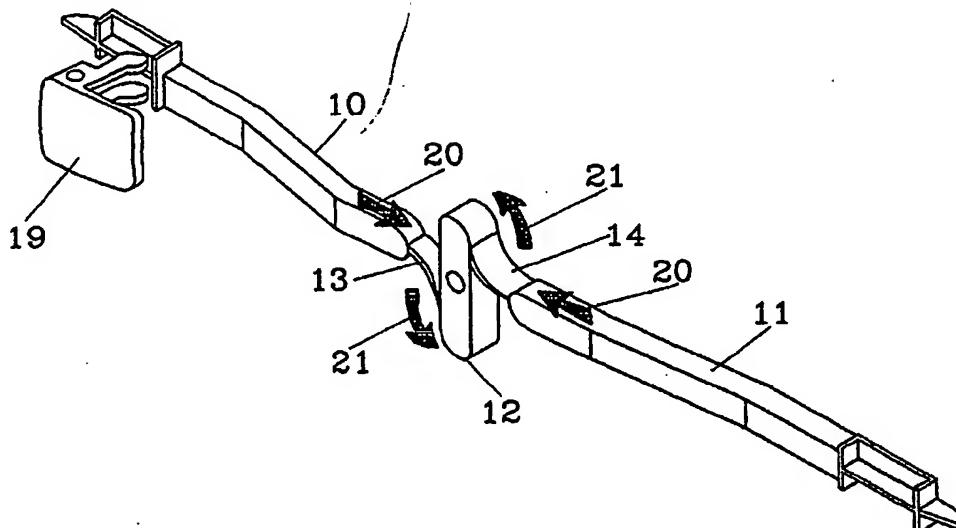


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>E05B 65/12, 15/04, E05C 1/02, 9/00, B29C 45/00</b>	A1	(11) International Publication Number: <b>WO 95/27115</b> (43) International Publication Date: <b>12 October 1995 (12.10.95)</b>
(21) International Application Number: <b>PCT/SE95/00305</b>		(81) Designated States: JP, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
(22) International Filing Date: <b>23 March 1995 (23.03.95)</b>		Published <i>With international search report. In English translation (filed in Swedish).</i>
(30) Priority Data: <b>9401093-1 31 March 1994 (31.03.94) SE</b>		
(71) Applicant (for all designated States except US): AB VOLVO [SE/SE]; S-405 08 Göteborg (SE).		
(72) Inventor; and		
(75) Inventor/Applicant (for US only): BERGGREN, Tony, J. [SE/SE]; Trossgatan 3, S-270 51 Skillinge (SE).		
(74) Agent: GÖTEBORGS PATENTBYRÅ AB; P.O. Box 5005, S-402 21 Göteborg (SE).		

D1

(54) Title: A MECHANISM FOR LOCKING LIDS



(57) Abstract

A mechanism for locking a lid and a method for producing the mechanism. The lid comprises at least one lock plunger (10, 11) which is longitudinally displaceable between guides in cooperation with a driver (12). The displacement takes place against the action of elastic means (13, 14) which constitute a functional connection between the driver (12) and the respective plunger (10, 11), for guiding both the opening and the locking action of the mechanism. The respective elastic means (13, 14) forms a curve between the driver (12) and the respective plunger (10, 11) when in its locking position. This curve is obtained by pretension of the respective elastic means. The driver (12), the respective elastic means (13, 14) and the respective plunger (10, 11) are produced in one piece by injection moulding of a plastic material. The injection of plastic material to the moulding tool is performed centrically via the driver (12).

1/1

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

## TITLE

A MECHANISM FOR LOCKING LIDS

5

## TECHNICAL FIELD

The present invention refers to a mechanism for locking a lid, comprising at least one lock plunger which is longitudinally displaceable between guides in cooperation 10 with a driver, which displacement takes place against the action of elastic means which constitute a functional connection between the driver and the respective plunger, for guiding both the opening and the locking action of the mechanism. Also, the invention is related to a method for 15 producing the mechanism.

## BACKGROUND OF THE INVENTION

The passenger compartment of a car usually comprises an instrument panel with a glove compartment which can be 20 locked by means of a lockable lid. The lid is usually for this purpose provided with a mechanism according to the above, for keeping the lid in its locked position. The mechanism shall be able to withstand the forces that occur in a collision, and be able to maintain the locking plungers 25 in their locking position in such a way, that the appearance of vibration related noise is minimized.

Usually, the mechanism comprises at least one locking 30 plunger which is pressed to its locking position by locking means. A driver is used for manipulating the plunger/plungers so that they can be moved out of their locking position. The details in the mechanism often comprise two plungers, two steel springs, a driver and means for limiting the stroke of the plungers. All these parts are 35 subjected to vibrations, which can generate noise at different frequencies.

The use of several parts in the mechanism results in substantial costs for storage. The assembly of these details is also comparatively work intensive and hard to automate. The use of parts of different materials like steel and 5 plastics lead to problems in recycling, because this also requires a considerable labour effort for separation into different categories of material. Also, metal parts are subjected to corrosion problems. Further it is desirable to reduce the weight of the vehicle, because this saves fuel.

10

#### THE TECHNICAL PROBLEM

One object of the present invention is therefore to provide a locking mechanism according the above, which can be produced in a simple and cost efficient manner. Another 15 object is that the switch button should facilitate recycling at the completion of its mission.

#### THE SOLUTION

For this purpose, the apparatus according to the invention 20 is characterized in that the respective elastic means forms a curve between the driver and the respective plunger, when it in its locking position, which curve is obtained by pretension of the respective elastic means, and that the driver, the respective elastic means and the respective 25 plunger is produced in one piece by injection moulding of a plastic material. The method according to the invention is characterized in that the injection of the plastic material into the moulding tool is performed centrically via the driver.

30

#### DESCRIPTION OF THE DRAWINGS

The invention will be described here below with reference to an embodiment shown in the accompanying drawing, in which

Fig. 1 is a side view of a locking mechanism according 35 to the invention,

Fig. 2 shows the locking mechanism in Fig. 1 in a plane view,

Fig. 3 shows the locking mechanism being manoeuvred out of its locking position, and

Fig. 4 shows the locking mechanism according to the invention in cooperation with a manipulating means.

5

#### DESCRIPTION OF EMBODIMENTS

The locking mechanism shown in Fig. 1 - 3 is symmetrically shaped with a rod-like locking plunger 10, 11 at each side of a centrically located driver 12, which is connected to the respective plunger 10, 11 via a an elastic part 13, 14. Because of the symmetrical shape, assembly into a dashboard panel 15 is facilitated.

15 Normally, the driver strives to maintain the neutral position shown in Fig. 2, in which the elastic parts are acting to press the plungers apart into their respective locking positions.

20 The elastic parts 13, 14 are designed in such a way that they serve as pull means when manoeuvring the locking mechanism out of its locking position. This can for example be performed as is shown in Fig. 4, by means of a manipulating means 19 which cooperates with a transverse wall surface on the plunger 10. When displacing the plunger 10 out of its locking position together with the plunger 11 in the direction of the arrows 20, the driver is turned anticlockwise in the directions of the arrows 21 for mediation of the movement from the plunger 10 to the plunger  
25 30 11.

35 The locking mechanism is produced in one piece, preferably by injection moulding of a plastic material, e.g. polyacetal. It is advantageous that the injection of material into the moulding tool is made centrically, i.e. via the driver 12. Then the material can flow via the elastic parts 13, 14 into the plungers 10, 11.

11/4/95

The injection tool is preferably so designed, that the two  
in opposite directions pointing plungers 10, 11 are located  
in parallel planes. When the mechanism then is assembled  
into the dashboard lid panel 15 the plungers 10, 11 shall be  
5 located along a common longitudinal axis, which also is  
congruent with an axle shaft 16 which houses the driver 12  
via an axle opening 17.

10 The dashboard lid panel 15 is provided with guides at 18,  
which define slots for guiding the movement of the  
respective plunger, and which limits the stroke of the  
plungers.

15 At the assembly, the plungers 10, 11 must be moved from the  
not shown unloaded parallel position, to the centrical  
position shown in Fig. 2. This results in a preloading of  
the elastic parts, so that they run in a curve between the  
driver and the respective plunger. By this preloading of the  
plungers 10, 11 via the elastic parts 13, 14, the plungers  
20 will be maintained in their respective locations between the  
guides 18, in a play-free manner. This means that the  
frequency related noise which is caused by vibration and  
shaking, can be avoided in this part of the car interior. *✓/✓/✓*

25 Because the locking mechanism only is comprised by one  
single detail, the cost for production and storage is  
reduced considerably. Also, assembly into a dashboard lid  
panel. Besides, does not have to be taken apart for  
recycling, at the completion of its mission.

30 The invention is not limited to the above described  
embodiment, but several variations are conceivable within  
the scope of the accompanying claims. For example, more or  
less plungers than two may be used. The plungers, the button  
35 may be provided with more than one tongue 23. Also, the  
driver and the elastic parts may be designed differently

than shown. Other means than the manipulating means 19 can be used for manipulation of the plungers 10, 11.

**CLAIMS**

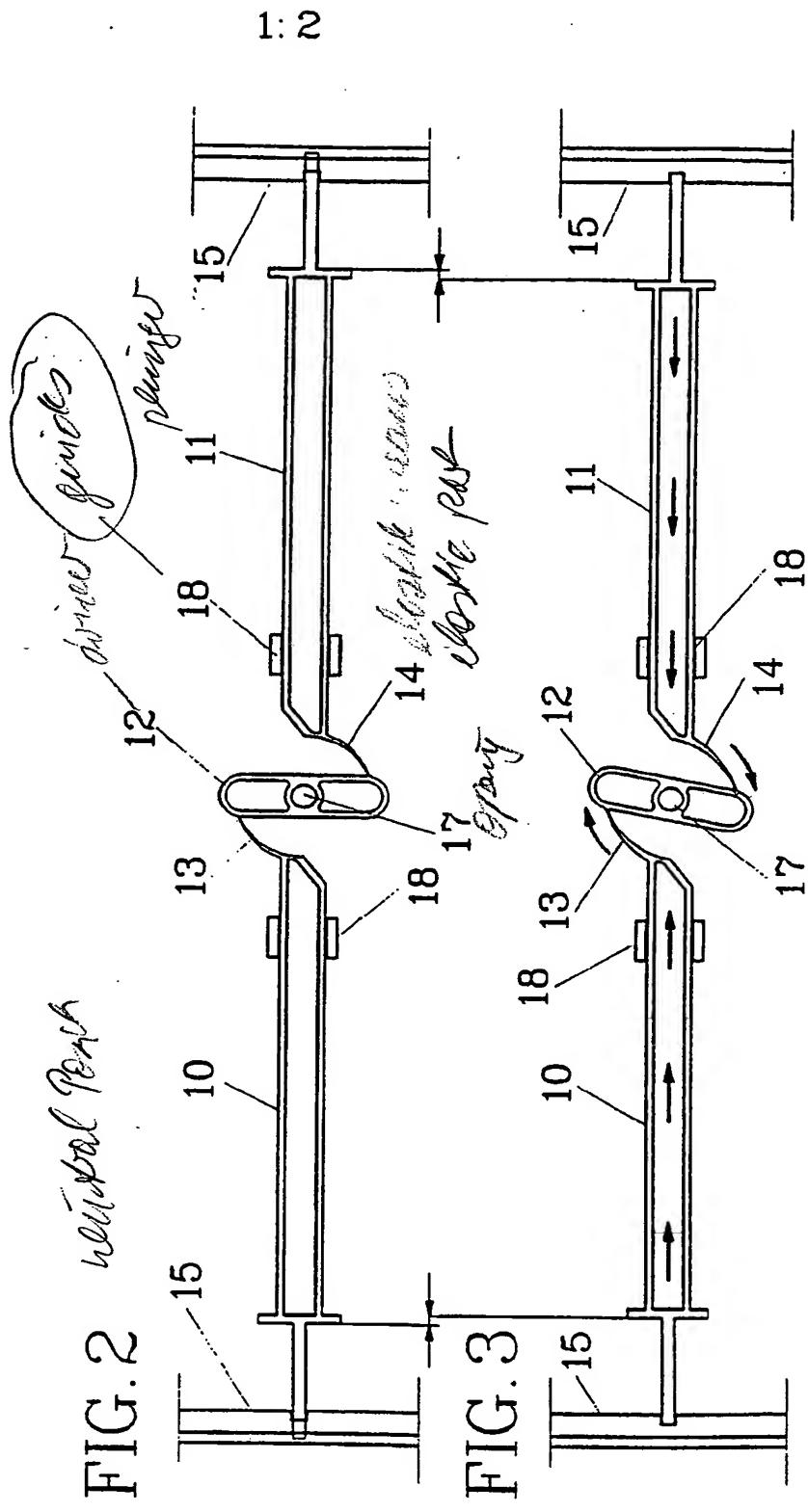
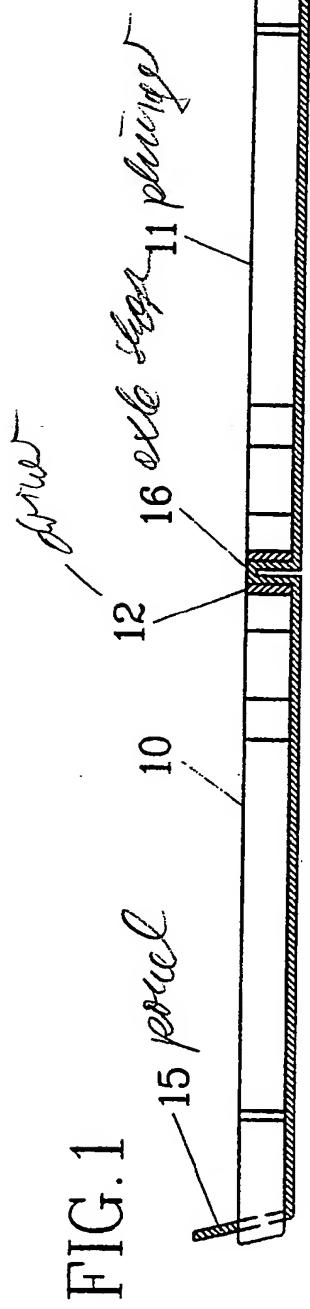
1. A mechanism for locking a lid, comprising at least one lock plunger (10, 11) which is longitudinally displaceable between guides (18) in cooperation with a driver (12), which displacement takes place against the action of elastic means (13, 14) which constitute a functional connection between the driver (12) and the respective plunger (10, 11), for guiding both the opening and the locking action of the mechanism,  
5 characterized in that the respective elastic means (13, 14) forms a curve between the driver (12) and the respective plunger (10, 11), when it is in its locking position, which curve is obtained by pretension of the respective elastic means, and that the driver (12), the respective elastic means (13, 14) and the respective plunger (10, 11) is produced in one piece by injection moulding of a plastic material.
- 20 2. A locking mechanism according to claim 1, characterized in that the driver (12) is produced in one piece with two elastic means (13, 14), each being connected to a respective plunger, by injection moulding of polyacetal plastic.
- 25 3. A locking mechanism according to claim 2, characterized in that a means (19) for manipulation cooperates with one of the plungers (10), wherein the manipulation of this plunger is mediated to the other plunger (11) via the two elastic means (13, 14) and the driver (12).
- 30 4. A method for production of a mechanism for locking a lid, comprising at least one lock plunger (10, 11) which is longitudinally displaceable between guides (18) in cooperation with a driver (12), which displacement takes

place against the action of elastic means (13, 14), which production is made in one piece by injection moulding of the driver (12), the elastic means (13, 14) and the plungers (10, 11) into an interconnected member,

5      characterized in that the injection of the plastic material into the moulding tool is performed centrically via the driver (12).

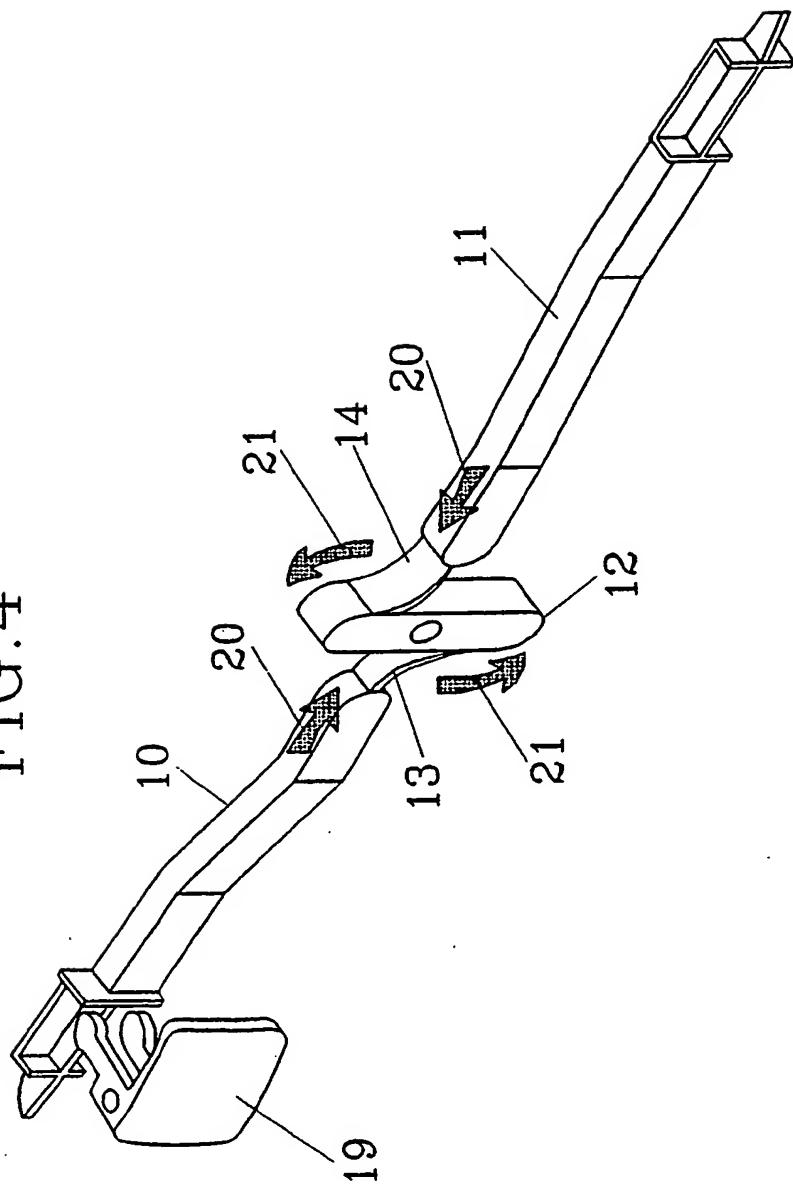
5.      A method according to claim 4,  
10     characterized in that the injection moulding takes place in a symmetrical tool, in which the plungers (10, 11) are arranged in two different parallel planes.

(D)



2:2

FIG. 4



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/00305

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC6:** E05B 65/12, E05B 15/04, E05C 1/02, E05C 9/00, B29C 45/00  
 According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC6:** E05B, E05C, B29C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4898529 (B.J. MUCHNIK ET AL), 6 February 1990 (06.02.90)  --	4-5
A	US, A, 3680901 (L.F. BIEBUYCK), 1 August 1972 (01.08.72)  --	
A	DE, C2, 3709536 (SOUTHCOC, INC.), 10 Sept 1992 (10.09.92)  --	
A	GB, A, 2206921 (W H SMITH & SONS (EXEXTRUSIONS) LIMITED), 18 January 1989 (18.01.89)  --	

 Further documents are listed in the continuation of Box C. See patent family annex.

- \* Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
- "B" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed
- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

20 June 1995

29 -06- 1995

Name and mailing address of the ISA/  
 Swedish Patent Office  
 Box 5055, S-102 42 STOCKHOLM  
 Facsimile No. + 46 8 666 02 86

Authorized officer

Christer Wendenius  
 Telephone No. + 46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/00305

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4781879 (K. OISHI), 1 November 1988 (01.11.88) --	
A	US, A, 4419321 (J.S. HARDIGG), 6 December 1983 (06.12.83) -- -----	

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

PCT/SE 95/00305

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A- 4898529	06/02/90	EP-A,A,A JP-A- US-A-	0303086 1088941 4877666	15/02/89 03/04/89 31/10/89
US-A- 3680901	01/08/72	AT-A,B- AT-B- BE-A,A- CA-A- DE-A- FR-A,A- NL-A-	313744 318427 769070 940966 2130003 2098048 7108461	15/01/74 25/10/74 03/11/71 29/01/74 03/02/72 03/03/72 02/02/72
DE-C2- 3709536	10/09/92	GB-A,B- US-A-	2190128 4705308	11/11/87 10/11/87
GB-A- 2206921	18/01/89	NONE		
US-A- 4781879	01/11/88	JP-C- JP-A-	1857669 62119730	27/07/94 01/06/87
US-A- 4419321	06/12/83	NONE		